

Dr. Pratheesh P. Gopinath

Agricultural Statistics | Applied AI

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Academic profile

Dr. Pratheesh P. Gopinath heads the Department of Agricultural Statistics at Kerala Agricultural University, with **over a decade of expertise in R programming and data analysis**. His research connects statistical methodology, agricultural biodiversity and applied AI.

Author of **grapesAgri1** and **grapesDraw**, he has developed **more than ten interactive R Shiny research tools**. He created **GRAPES**, a free platform serving **more than two lakh researchers**, and leads **RAISINS**, integrating R, Python and AI, through mentorship of Statoberry LLP.

His contributions include computer vision for fruit grading and disease detection, and predictive analytics supporting Kerala's COVID-19 policy response. As a founder of the open-access *Journal of Sustainable Technology in Agriculture* (JOSTA), he promotes transparent, accessible scientific publishing.

Academic qualifications

Ph.D. in Agricultural Statistics, ICAR-Indian Agricultural Research Institute, New Delhi (2021).

OGPA: **80.3/100**. Dissertation: *Statistical Designs for Factorial Treatment Structure*. Developed construction methods for row-column designs to control two sources of experimental heterogeneity in factorial trials.

M.Sc. in Agricultural Statistics, ICAR-Indian Agricultural Research Institute, New Delhi (2014).

OGPA: **82.7/100**. Advanced training in experimental design, linear models, sampling, time-series analysis and statistical computing.

Academic achievements and research leadership

- **Research impact:** **820 citations** | **h-index 11** | **i10-index 11**, Google Scholar, **14 September 2026**. 100+ peer-reviewed publications.
- **Research software:** developer of KAU-GRAPES and co-author of the peer-reviewed *grapesAgri1* software paper in the *Journal of Open Source Software* (2021). Author/co-author of the R packages *grape-Agri1* and *grapesDraw*.
- **Postgraduate research mentorship:** advisory committee member guiding **200+ postgraduate and Ph.D. students** across agricultural, environmental and allied disciplines.
- **National capacity development:** course director for **7 national training programmes (2022-2025)**, reaching **487 researchers and scientists**, in statistical methods, experimental design, R programming and multivariate analysis.
- **Academic appointments:** Assistant Professor and Head, KAU, **2023-present**; previously Assistant Professor of Statistics, Nehru Arts and Science College, Kanhangad, **2017-2019**.

Statistical methodology: first-author publications on incomplete row-column designs with factorial treatment structure (*Communications in Statistics - Theory and Methods*, 2018) and two-dimensional balanced sampling plans (*Communications in Statistics - Simulation and Computation*, 2018).

Selected honours

- **Winner, National Research Innovation Challenge 2022**, Kerala Startup Mission, Government of Kerala.
- **Best Oral Presentation**, 74th Annual Conference of the Indian Society of Agricultural Statistics, Navsari Agricultural University, February 2024.
- **Best Poster Award**, International Seminar on Sustainable Urban Agricultural Systems and Community Resilient Cities, College of Agriculture, Vellayani, March 2024.
- **Third Best Paper**, High Throughput Crop Improvement theme, KAU-CORTEVA International Plant Science Symposium, 2024.

Five selected papers on biodiversity and genetic resources

1. Diversity of cultivated sesame and wild relatives

Varadha Gayathri V. P., Lovely B., Arya K., Jayapal, A., and **Gopinath, P. P.** (2025). **Integrated morphological and biochemical analysis of selected sesame (*Sesamum* spp.) species.** *Frontiers in Plant Science*, **16**, 1571363.

[doi:10.3389/fpls.2025.1571363](https://doi.org/10.3389/fpls.2025.1571363)

Characterizes **27 genotypes across four species**, integrating morphological and biochemical evidence. Highlights the value of traditional cultivars and wild relatives as sources of useful variation for crop improvement and the conservation of agrobiodiversity.

2. Conservation and utilization of tamarind genetic resources

Menon, J. S., Asna, A. C., Menon, M. V., Pooja, A., **Gopinath, P. P.**, and Singh, A. K. (2023). **In situ characterization of tamarind (*Tamarindus indica* L.) fruit and spotting sweet tamarind types in Palakkad gap of Kerala.** *Plant Genetic Resources*, **21**(2), 166-173.

[doi:10.1017/S1479262123000588](https://doi.org/10.1017/S1479262123000588)

Documents variation in **113 collections**, using principal-component-based hierarchical clustering to distinguish fruit types. Identifies promising sweet types and provides evidence relevant to conserving Kerala's eroding tamarind gene pool.

3. Rice germplasm diversity for nutritional improvement

Kumar, A. S., Vighneswaran, V., Thomas, D., Seeja G., Thomas, B., and **Gopinath, P. P.** (2025). **Assessment of Genetic Diversity for Grain Iron and Zinc Contents among 123 Rice Germplasm Lines.** *Journal of Advances in Biology & Biotechnology*, **28**(10), 1610-1622.

[doi:10.9734/jabb/2025/v28i103176](https://doi.org/10.9734/jabb/2025/v28i103176)

Evaluates **123 rice germplasm lines** for biometric and grain micronutrient traits. Demonstrates the breeding value of genetic variation, including traditional varieties, and identifies potential donors for biofortification programmes.

4. National Genebank resources for okra improvement

Suma, A., John, K. J., Latha, M., Thirumalaisamy, P. P., Venkatesan, K., Neeraja, P., **Gopinath, P. P.**, et al. (2025). **Exploring the genetic potential of cultivated genepool of okra from National Genebank, India.** *Genetic Resources and Crop Evolution*, **72**, 8801-8817.

[doi:10.1007/s10722-025-02470-4](https://doi.org/10.1007/s10722-025-02470-4)

Characterizes **553 okra genotypes** from India's National Genebank to identify useful variation and promising genetic stocks. Contributed statistical analysis, editing and compilation of results as part of the collaborative team.

5. Forest biological resources and tribal livelihoods

Jerin, V. A., Lazarus, T. P., Gopakumar, S., Durga, A. R., Nishan, M. A., and **Gopinath, P. P.** (2022). **Role of Non-Timber Forest Products in Income Generation of the Tribal Population: A Review.** *Asian Journal of Agricultural Extension, Economics & Sociology*, **40**(11), 285-294.

[doi:10.9734/AJAEES/2022/v40i111711](https://doi.org/10.9734/AJAEES/2022/v40i111711)

Reviews the role of forest biological resources in food, medicine, income and employment. Adds a human dimension to the biodiversity portfolio through resource use, value addition and indigenous livelihoods.

Artificial intelligence and research software contributions

Published applications of AI and machine learning

Black pepper disease identification. Co-authored a CNN-based study classifying healthy leaves and disease symptoms, including anthracnose stages and foot rot. The study reports **98.72% accuracy on its unseen test dataset**, using 2,786 original field images expanded through augmentation, and a demonstration web application.

Sreethu, P. T., Paul, M. M., **Gopinath, P. P.**, Shahana, I. L., and Radhika, N. S. (2025). Foliar symptom-based disease detection in black pepper using convolutional neural network. *Phytopathology Research*, **7**, 21. [doi:10.1186/s42483-024-00305-1](https://doi.org/10.1186/s42483-024-00305-1)

Computer vision for banana grading. Contributed **software, methodology, supervision, and manuscript review** to a nine-layer CNN for Nendran banana ripeness classification. The study used **4,320 images**, reported **95% classification accuracy**, and developed a web application to demonstrate grading across four ripeness stages.

Arunima, P. L., **Gopinath, P. P.**, Geetha Lekshmi, P. R., and Esakkimuthu, M. (2024). Digital assessment of post-harvest Nendran banana for faster grading: CNN-based ripeness classification model. *Postharvest Biology and Technology*, **214**, 112972. [doi:10.1016/j.postharvbio.2024.112972](https://doi.org/10.1016/j.postharvbio.2024.112972). **Google Scholar: 49 citations** (14 September 2026).

Machine learning for coconut nutrient diagnosis. Co-authored research integrating compositional nutrient diagnosis and machine learning using data from **120 coconut fields** to distinguish co-occurring nutrient deficiencies. Neeshma N., Raj, K. K., **Gopinath, P. P.**, et al. (2026). Disambiguation of multiple nutrient deficiency stresses in coconut using compositional nutrient diagnostic norms powered by machine learning algorithms. *Scientific Reports*, **16**, 13713. [doi:10.1038/s41598-026-40501-x](https://doi.org/10.1038/s41598-026-40501-x)

Accessible analytical platforms

GRAPES and open-source R software. Created GRAPES (General R-based Analysis Platform Empowered by Statistics), a free online platform with **30+ analytical modules**, **200,000+ users across 100+ countries**, and **200+ scholarly citations**. The R packages *grapesAgri1* and *grapesDraw* support agricultural analysis and visualization, with **40,000+ combined CRAN downloads** reported in June 2026.

Gopinath, P. P., Parsad, R., Joseph, B., and Adarsh, V. S. (2021). grapesAgri1: Collection of Shiny Apps for Data Analysis in Agriculture. *Journal of Open Source Software*, **6**(63), 3437. [doi:10.21105/joss.03437](https://doi.org/10.21105/joss.03437)

RAISINS and innovation mentorship. Leads the development of RAISINS, an online analytical platform integrating **R, Python and AI**, through mentorship of Statoberry LLP. Also serves as Principal Mentor of the K-Agtech Launchpad, involving KAU, NABARD and Western Sydney University.

Selected research projects

- **Principal Investigator:** GRAPES PBGN, AI-based statistical software for plant breeding and genetics; Kerala Startup Mission (RINP).
- **Principal Investigator:** development and scalability of a statistical package for agricultural data analysis; RARS Vellayani.
- **Co-Investigator:** QTL mapping for nutritional and functional properties of Kerala rice landraces using association genetic analysis; State Plan Project.
- **Co-Investigator:** climate-change and flood impacts on Kerala soils, including mitigation and adaptation strategies; State Plan Project.
- **Co-Investigator:** AI chatbots for cashew extension and advisory services; ICAR-Directorate of Cashew Research, Puttur.

Academic service and expertise

Service: Founder and Managing Editor, *Journal of Sustainable Technology in Agriculture* (JOSTA); member, Technical Advisory Panel, Agriculture Division, Kerala State Planning Board (2023); facilitator, Young Innovators Programme, Government of Kerala.

Expertise: experimental design; multivariate analysis; genetic-divergence analysis; mixed models; R and Python; Shiny applications; convolutional neural networks; reproducible research workflows.